



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/087,210

03/04/2002

Shinichi Nishizawa

075120-0030

6903

25269

7590

05/23/2008

DYKEMA GOSSETT PLLC
FRANKLIN SQUARE, THIRD FLOOR WEST
1300 I STREET, NW
WASHINGTON, DC 20005

EXAMINER

GUILL, RUSSELL L

ART UNIT

PAPER NUMBER

2123

MAIL DATE

DELIVERY MODE

05/23/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/087,210	Applicant(s) NISHIZAWA ET AL.	
	Examiner Russ Guill	Art Unit 2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 April 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,4,6-18 and 20-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1,3,4,6-18 is/are allowed.
- 6) ☒ Claim(s) 20-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 April 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office Action is in response to an After Final Amendment filed April 28, 2008. Claim 19 were canceled. Claims 1, 3 - 4, 6 - 18 and 20 - 22 are pending. Claims 1, 3 - 4, 6 - 18 and 20 - 22 have been examined. Claims 1, 3 - 4 and 6 - 18 are allowable over the prior art of record. Claims 20 - 22 are rejected.
2. The finality of the previous Office action is withdrawn due to newly discovered references during an updated search.
3. **As recited in the previous Office Action, the Examiner would like to thank the Applicant for the well-presented response, which was useful in the examination process.**

Response to Remarks

4. After further search and consideration, rejections of claims 20 - 22 are made below.

Claim Objections

5. Claim 20 is objected to for the following minor informality: in line 5, a full stop is embedded in the claim.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Art Unit: 2123

a. Claim 18 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

i. Regarding claim 18, the claim recites, "the system". The term appears to have insufficient antecedent basis.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. **Claims 20 - 22** are rejected under 35 U.S.C. 103(a) as being unpatentable over Palazzetti (U.S. Patent Number 3,770,292), in view of Delorenzis (U.S. Patent Number 6,293,530) further in view of Goetzen (U.S. Patent Number 6,293,561), further in view of Schubert (U.S. Patent Number 6,029,764).

- a. The art of Palazzetti is directed to electronic control for vehicle suspension systems, including a hydropneumatic suspension (Abstract).
- b. The art of Delorenzis is directed to a liquid spring system for vibration control in vehicles (Abstract).
- c. The art of Goetzen is directed toward a wheel suspension system using active suspension in a vehicle (column 3, lines 29 - 60).
- d. The art of Schubert is directed toward an active suspension system in a vehicle (title).
- e. The art of Palazzetti and the art of Delorenzis are analogous art because they are both directed to the art of active suspension for vehicles.
- f. The art of Palazzetti and the art of Goetzen are analogous art because they are both directed to the art of active suspension for vehicles.
- g. The art of Palazzetti and the art of Schubert are analogous art because they are both directed to the art of active suspension for vehicles.
- h. The motivation to use the art of Delorenzis with the art of Palazzetti would have been the benefits recited in Delorenzis including the important advantage that vehicle stabilizer bars can be eliminated (column 10, lines 20 - 25).
- i. The motivation to use the art of Goetzen with the art of Palazzetti would have been the benefit recited in Goetzen that the benefits recited in Goetzen, including that the system achieve a reduction in the number of components in the suspension system (column 2, lines 1 - 2), which would have been recognized as a benefit by the ordinary artisan.
- j. The motivation to use the art of Schubert with the art of Palazzetti would have been the benefits recited in Schubert including the invention provides an improved active suspension system (column 2, lines 50 - 55), and each isolator can be controlled separately to improve vibration isolation (column 5, lines 45 - 55).

k. Regarding claim 20:

l. Palazzetti appears to teach:

i. A ~~six degree of freedom~~ force field generator for simulating a spring (figure 1, element 20, and figure 2, and Abstract, last sentence), said force field generator secured in a suspension system (figure 1 and figure 2), and means for activating the force field generator to produce forces therein (figure 1, figure 2, and columns 3 - 6) ~~for characterizing six degree of freedom spring reaction forces.~~

m. Palazzetti does not specifically teach:

i. A six degree of freedom force field generator

ii. ~~Means for activating the force field generator to produce forces therein~~ for characterizing six degree of freedom spring reaction forces.

iii. Wherein the force field generator comprises: a damper including a housing and a telescopic strut, the strut being axially movable between respective fully extended and fully compressed positions; a first support secured to the housing and second support secured to the strut for relative movement in the extended and compressed positions; a plurality of hydraulic cylinders secured between the first and second supports, said cylinders being actuatable for exerting a force between the first and second supports.

n. Delorenzis appears to teach:

i. a force field generator to produce forces therein for characterizing spring reaction forces (column 13, lines 25 - 31; please note that the limitation appears to be an intended use, and thus does not limit the claim, and is not given patentable weight).

o. Schubert appears to teach:

Art Unit: 2123

- i. A six degree of freedom force field generator (*column 17, lines 39 - 41*);
- ii. the force field generator comprises a plurality of hydraulic cylinders secured between the first and second supports, said cylinders being actuatable for exerting a force between the first and second supports (*figures 1 and 2, elements 28, 30, 32; and Abstract*).

p. Goetzen appears to teach:

- i. A six degree of freedom force field generator (*column 3, lines 41 - 45*);
- ii. a damper including a housing and a telescopic strut, the strut being axially movable between respective fully extended and fully compressed positions (*figures 11a and 11b, elements 33, 35; and column 7, lines 37 - 45*); a first support secured to the housing and second support secured to the strut for relative movement in the extended and compressed positions (*figures 11a and 11b, element 32 and unnumbered support at the top*); a plurality of hydraulic cylinders secured between the first and second supports, said cylinders being actuatable for exerting a force between the first and second supports (*figure 1; and column 3, lines 29 - 60*).

q. Therefore, as discussed above, it would have been obvious to the ordinary artisan at the time of invention to use the art of Delorenzis and the art of Goetzen and the art of Schubert with the art of Palazzetti to produce the claimed invention.

r. Regarding **claim 21**:

s. Palazatti does not specifically teach:

- t. A force sensor for each hydraulic cylinder for producing an output corresponding to the force produced by each respective cylinder when actuated.

u. Goetzen appears to teach:

v. A force sensor for each hydraulic cylinder for producing an output corresponding to the force produced by each respective cylinder when actuated (*column 3, lines 38 - 40, measurement transducers*).

w. Obviousness must be determined in light of knowledge of the ordinary artisan. The following references teach knowledge of the ordinary artisan.

i. Williams (U.S. Patent Number 6,259,982) teaches a force sensor attached to a hydraulic cylinder (*column 5, lines 4 - 8*).

ii. Boichot (U.S. Patent Number 6,112,866) teaches a force sensor attached to a hydraulic cylinder (*column 5, lines 4 - 8*).

x. Regarding **claim 22**:

y. Palazatti does not specifically teach:

z. A hydraulic circuit for selectively actuating each of the hydraulic cylinders and producing a selectable force therein; control means for controlling the hydraulic circuit; and means responsive to the force sensors in feedback relation with the control means for controlling the forces produced in the cylinders.

aa. Schubert appears to teach:

bb. A hydraulic circuit for selectively actuating each of the hydraulic cylinders and producing a selectable force therein; control means for controlling the hydraulic circuit; and means responsive to the force sensors in feedback relation with the control means for controlling the forces produced in the cylinders (*Abstract, and figure 8, element 28, load sensors, hydraulic valve*).

10. Examiner's Note: Examiner has cited particular columns and line numbers in the references applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to

specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in their entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner.

Allowable Subject Matter

11. Claims 1, 3 – 4 and 6 – 18 are allowable over the prior art of record.

12. Following is a statement of reasons for indicating allowable subject matter:

13. While Gran (U.S. Patent Number 6,022,005) teaches a six degree of freedom force field generator, and Palazzetti (U.S. Patent Number 3,770,292) teaches a force field generator for simulating a spring, securing the force field generator to a suspension system, activating the force field generator to produce forces, and Delorenzis (U.S. Patent Number 6,293,530) teaches a force field generator to produce forces for characterizing spring reaction forces, none of these references either alone or in combination with the prior art of record teaches a method for modeling a coil spring on a suspension system in terms of derived torque and force characteristics of a coil spring, specifically including:

- a. Regarding claim 1, “measuring suspension characteristics”, “deriving a coil spring design specification based upon the measured characteristics”, in combination with the remaining features and elements of the claimed invention. It is for these reasons that the Applicant’s invention defines over the prior art of record.

Art Unit: 2123

14. While Gran (U.S. Patent Number 6,022,005) teaches assembling a six degree of freedom mechanism having spaced apart moveable platforms and a plurality of actuatable links interconnecting the platforms at corresponding joints on opposite ends of each link, specifying a kinematics relationship between the platforms and the links, actuating the links to generate corresponding applied forces and torques at each joint, and Palazzetti (U.S. Patent Number 3,770,292) teaches applying a force field mechanism to an automobile suspension, none of these references either alone or in combination with the prior art of record teaches a method for modeling a coil spring in terms of torque and force characteristics to produce a spring design mechanism for an automobile suspension, specifically including:

- a. Regarding claim 4, “measuring the derived forces and torques”, “deriving the force and torque characteristics of the coil spring to be designed based upon the kinematics relationship and the corresponding applied forces and torques at each joint”, in combination with the remaining features and elements of the claimed invention. It is for these reasons that the Applicant’s invention defines over the prior art of record.

Conclusion

15. The prior art made of record and not relied upon is pertinent to the Applicant’s disclosure. The following references teach knowledge of the ordinary artisan:

- a. S. Tosunoglu et al., “Development and demonstration of a teleoperated modular robot system”, December 1992, University of Texas at Austin; teaches an active parallel mechanism for active spring design (*eighth page of document, first paragraph that starts with, “Stiffness modulation capability . . .”*).
- b. Byung-Ju Yi et al., “Geometric characteristics of antagonistic stiffness in redundantly actuated mechanisms”, 1993, Proceedings of the 1993 IEEE International Conference on Robotics and Automation, pages 654 – 661; teaches a

parallel mechanism directly analogous to a wound metal spring (*page 654, Abstract*).

c. Williams (U.S. Patent Number 6,259,982) teaches a force sensor attached to a hydraulic cylinder (*column 5, lines 4 – 8*).

d. Boichot (U.S. Patent Number 6,112,866) teaches a force sensor attached to a hydraulic cylinder (*column 5, lines 4 – 8*).

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Russ Guill whose telephone number is 571-272-7955.

The examiner can normally be reached on Monday – Friday 9:30 AM – 6:00 PM.

17. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Rodriguez can be reached on 571-272-3753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Any inquiry of a general nature or relating to the status of this application should be directed to the TC2100 Group Receptionist: 571-272-2100.

18. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Russ Guill
Examiner
Art Unit 2123

RG

/Paul L Rodriguez/

Supervisory Patent Examiner, Art Unit 2123